SEQUENCE LISTING

<110> Seeley, Todd W.

<120> huBUB3 GENE INVOLVED IN HUMAN CANCERS

<130> PP-01406.004/200130.438D1

<140> US
<141> 2002-02-27

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<213> Homo sapien

<400> 2

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Tyr Asp Pro Thr His Ala Trp Ser Gly Gly Leu Asp His Gln Leu Lys
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Thr Gly Ser Trp Asp Gln Thr Val Lys Leu Trp Asp Pro Arg Thr Pro
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Cys Asn Ala Gly Thr Phe Ser Gln Pro Glu Lys Val Tyr Thr Leu Ser
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Val Ser Gly Asp Arg Leu Ile Val Gly Thr Ala Gly Arg Arg Val Leu
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Val Trp Asp Leu Arg Asn Met Gly Tyr Val Gln Gln Arg Arg Glu Ser
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Ser Leu Lys Tyr Gln Thr Arg Cys Ile Arg Ala Phe Pro Asn Lys Gln
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Gly Tyr Val Leu Ser Ser Ile Glu Gly Arg Val Ala Val Glu Tyr Leu
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Asp Pro Ser Pro Glu Val Gln Lys Lys Lys Tyr Ala Phe Lys Cys His
    210                 215                 220
Arg Leu Lys Glu Asn Asn Ile Glu Gln Ile Tyr Pro Val Asn Ala Ile
225                 230                 235                 240
Ser Phe His Asn Ile His Asn Thr Phe Ala Thr Gly Gly Ser Asp Gly
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Phe Val Asn Ile Trp Asp Pro Phe Asn Lys Lys Arg Leu Cys Gln Phe
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Leu Glu His Leu Met Lys Glu Phe Leu Asp Lys Lys Lys Tyr His Asn
    50                  55                  60
Asp Pro Arg Phe Ile Ser Tyr Cys Leu Lys Phe Ala Glu Tyr Asn Ser
65                  70                  75                  80
Asp Leu His Gln Phe Phe Glu Phe Leu Tyr Asn His Gly Ile Gly Thr
                85                  90                  95
Leu Ser Ser Pro Leu Tyr Ile Ala Trp Ala Gly His Leu Glu Ala Gln
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Gln Ala Glu Pro Arg Glu Phe Leu Gln Gln Gln Tyr Arg Leu Phe Gln
    130                 135                 140
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Pro Leu His Asn Val Gln Val Leu Asn Gln Met Ile Thr Ser Lys Ser
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Asn Pro Gly Asn Asn Met Ala Cys Ile Ser Lys Asn Gln Gly Ser Glu
            180                 185                 190
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Arg Arg Val Ile Thr Ile Ser Lys Ser Glu Tyr Ser Val His Ser Ser
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            260                 265                 270
Arg His Tyr Met Lys Arg Lys Glu Ala Asn Ala Phe Glu Glu Gln Leu
        275                 280                 285
Leu Lys Gln Lys Met Asp Glu Leu His Lys Lys Leu His Gln Val Val
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Glu Thr Ser His Glu Asp Leu Pro Ala Ser Gln Glu Arg Ser Glu Val
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Lys Asn Pro Arg Glu Ala Pro Pro Val Val Pro Pro Leu Ala Asn Ala
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        435                 440                 445
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Ala Trp Gly Val Asn Lys Ile Ile Ser Ser Leu Ser Ser Ala Phe His
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    530                 535                 540
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Asp Asp Ser Thr Val Trp Gly Ile Arg Cys Asn Lys Thr Leu Ala Pro
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Ser Pro Lys Ser Pro Gly Asp Phe Thr Ser Ala Ala Gln Leu Ala Ser
        595                 600                 605
Thr Pro Phe His Lys Leu Pro Val Glu Ser Val His Ile Leu Glu Asp
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Lys Glu Asn Val Val Ala Lys Gln Cys Thr Gln Ala Thr Leu Asp Ser
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Cys Glu Glu Asn Met Val Val Pro Ser Arg Asp Gly Lys Phe Ser Pro
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    690                 695                 700
Ala Ala Ile Ala Glu Asp Pro Pro Asp Ala Ile Ala Gly Leu Gln Ala
705                 710                 715                 720
Glu Trp Met Gln Met Ser Ser Leu Gly Thr Val Asp Ala Pro Asn Phe
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Ile Val Gly Asn Pro Trp Asp Asp Lys Leu Ile Phe Lys Leu Leu Ser
            740                 745                 750
Gly Leu Ser Lys Pro Val Ser Ser Tyr Pro Asn Thr Phe Glu Trp Gln
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Cys Lys Leu Pro Ala Ile Lys Pro Lys Thr Glu Phe Gln Leu Gly Ser
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Lys Leu Val Tyr Val His His Leu Leu Gly Glu Gly Ala Phe Ala Gln
785                 790                 795                 800
Val Tyr Glu Ala Thr Gln Gly Asp Leu Asn Asp Ala Lys Asn Lys Gln
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Lys Phe Val Leu Lys Val Gln Lys Pro Ala Asn Pro Trp Glu Phe Tyr
            820                 825                 830
Ile Gly Thr Gln Leu Met Glu Arg Leu Lys Pro Ser Met Gln His Met
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Phe Met Lys Phe Tyr Ser Ala His Leu Phe Gln Asn Gly Ser Val Leu
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Val Gly Glu Leu Tyr Ser Tyr Gly Thr Leu Leu Asn Ala Ile Asn Leu
865                 870                 875                 880
Tyr Lys Asn Thr Pro Glu Lys Val Met Pro Gln Gly Leu Val Ile Ser
                885                 890                 895
Phe Ala Met Arg Met Leu Tyr Met Ile Glu Gln Val His Asp Cys Glu
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Ile Ile His Gly Asp Ile Lys Pro Asp Asn Phe Ile Leu Gly Asn Gly
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Phe Leu Glu Gln Asp Asp Glu Asp Asp Leu Ser Ala Gly Leu Ala Leu
    930                 935                 940
Ile Asp Leu Gly Gln Ser Ile Asp Met Lys Leu Phe Pro Lys Gly Thr
945                 950                 955                 960
Ile Phe Thr Ala Lys Cys Glu Thr Ser Gly Phe Gln Cys Val Glu Met
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Leu Ser Asn Lys Pro Trp Asn Tyr Gln Ile Asp Tyr Phe Gly Val Ala
            980                 985                 990
Ala Thr Val Tyr Cys Met Leu Phe Gly Thr Tyr Met Lys Val Lys Asn
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Glu Gly Gly Glu Cys Lys Pro Glu Gly Leu Phe Arg Arg Leu Pro His
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Leu Asp Met Trp Asn Glu Phe Phe His Val Met Leu Asn Ile Pro Asp
1025                1030                1035                1040
Cys His His Leu Pro Ser Leu Asp Leu Leu Arg Gln Lys Leu Lys Lys
                1045                1050                1055
Val Phe Gln Gln His Tyr Thr Asn Lys Ile Arg Ala Leu Arg Asn Arg
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35 40 45
Met Arg Leu Lys Tyr Gln His Thr Gly Ala Val Leu Asp Cys Ala Phe
50 55 60
Tyr Asp Pro Thr His Ala Trp Ser Gly Gly Leu Asp His Gln Leu Lys
65 70 75 80
Met His Asp Leu Asn Thr Asp Gln Glu Asn Leu Val Gly Thr His Asp
85 90 95
Ala Pro Ile Arg Cys Val Glu Tyr Cys Pro Glu Val Asn Val Met Val
100 105 110
Thr Gly Ser Trp Asp Gln Thr Val Lys Leu Trp Asp Pro Arg Thr Pro
115 120 125
Cys Asn Ala Gly Thr Phe Ser Gln Pro Glu Lys Val Tyr Thr Leu Ser
130 135 140
Val Ser Gly Asp Arg Leu Ile Val Gly Thr Ala Gly Arg Arg Val Leu
145 150 155 160
Val Trp Asp Leu Arg Asn Met Gly Tyr Val Gln Gln Arg Arg Glu Ser
165 170 175
Ser Leu Lys Tyr Gln Thr Arg Cys Ile Arg Ala Phe Pro Asn Lys Gln
180 185 190
Gly Tyr Val Leu Ser Ser Ile Glu Gly Arg Val Ala Val Glu Tyr Leu
195 200 205
Asp Pro Ser Pro Glu Val Gln Lys Lys Lys Tyr Ala Phe Lys Cys His
210 215 220
Arg Leu Lys Glu Asn Asn Ile Glu Gln Ile Tyr Pro Val Asn Ala Ile
225 230 235 240
Ser Phe His Asn Ile His Asn Thr Phe Ala Thr Gly Gly Ser Asp Gly

```
                245                 250                 255
Phe Val Asn Ile Trp Asp Pro Phe Asn Lys Lys Arg Leu Cys Gln Phe
            260                 265                 270
His Arg Tyr Pro Thr Ser Ile Ala Ser Leu Ala Phe Ser Asn Asp Gly
        275                 280                 285
Thr Thr Leu Ala Ile Ala Ser Ser Tyr Met Tyr Glu Met Asp Asp Thr
    290                 295                 300
Glu His Pro Glu Asp Gly Ile Phe Ile Arg Gln Val Thr Asp Ala Glu
305                 310                 315                 320
Thr Lys Pro Lys Val His Leu Ile Ile Leu
                325                 330
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<210> 28
<211> 341
<212> PRT
<213> Saccharomyces cerevisiae

<400> 28

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Met Gln Ile Val Gln Ile Glu Gln Ala Pro Lys Asp Tyr Ile Ser Asp
 1               5                  10                  15
Ile Lys Ile Ile Pro Ser Lys Ser Leu Leu Leu Ile Thr Ser Trp Asp
            20                  25                  30
Gly Ser Leu Thr Val Tyr Lys Phe Asp Ile Gln Ala Lys Asn Val Asp
        35                  40                  45
Leu Leu Gln Ser Leu Arg Tyr Lys His Pro Leu Leu Cys Cys Asn Phe
    50                  55                  60
Ile Asp Asn Thr Asp Leu Gln Ile Tyr Val Gly Thr Val Gln Gly Glu
65                  70                  75                  80
Ile Leu Lys Val Asp Leu Ile Gly Ser Pro Ser Phe Gln Ala Leu Thr
                85                  90                  95
Asn Asn Glu Ala Asn Leu Gly Ile Cys Arg Ile Cys Lys Tyr Gly Asp
            100                 105                 110
Asp Lys Leu Ile Ala Ala Ser Trp Asp Gly Leu Ile Glu Val Ile Asp
        115                 120                 125
Pro Arg Asn Tyr Gly Asp Gly Val Ile Ala Val Lys Asn Leu Asn Ser
    130                 135                 140
Asn Asn Thr Lys Val Lys Asn Lys Ile Phe Thr Met Asp Thr Asn Ser
145                 150                 155                 160
Ser Arg Leu Ile Val Gly Met Asn Asn Ser Gln Val Gln Trp Phe Arg
                165                 170                 175
Leu Pro Leu Cys Glu Asp Asp Asn Gly Thr Ile Glu Glu Ser Gly Leu
            180                 185                 190
Lys Tyr Gln Ile Arg Asp Val Ala Leu Leu Pro Lys Glu Gln Glu Gly
        195                 200                 205
Tyr Ala Cys Ser Ser Ile Asp Gly Arg Val Ala Val Glu Phe Phe Asp
    210                 215                 220
Asp Gln Gly Asp Asp Tyr Asn Ser Ser Lys Arg Phe Ala Phe Arg Cys
225                 230                 235                 240
His Arg Leu Asn Leu Lys Asp Thr Asn Leu Ala Tyr Pro Val Asn Ser
                245                 250                 255
Ile Glu Phe Ser Pro Arg His Lys Phe Leu Tyr Thr Ala Gly Ser Asp
            260                 265                 270
Gly Ile Ile Ser Cys Trp Asn Leu Gln Thr Arg Lys Lys Ile Lys Asn
        275                 280                 285
```

```
Phe Ala Lys Phe Asn Glu Asp Ser Val Val Lys Ile Ala Cys Ser Asp
    290                 295                 300
Asn Ile Leu Cys Leu Ala Thr Ser Asp Asp Thr Phe Lys Thr Asn Ala
305                 310                 315                 320
Ala Ile Asp Gln Thr Ile Glu Leu Asn Ala Ser Ser Ile Tyr Ile Ile
                325                 330                 335
Phe Asp Tyr Glu Asn
            340
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<210> 29
<211> 326
<212> PRT
<213> Mus musculus

<400> 29

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Met Thr Gly Ser Asn Glu Phe Lys Leu Asn Gln Pro Pro Glu Asp Gly
 1               5                  10                  15
Ile Ser Ser Val Lys Phe Ser Pro Asn Thr Ser Gln Phe Leu Leu Val
            20                  25                  30
Ser Ser Trp Asp Thr Ser Val Arg Leu Tyr Asp Val Pro Ala Asn Ser
        35                  40                  45
Met Arg Leu Lys Tyr Gln His Thr Gly Ala Val Leu Asp Cys Ala Phe
    50                  55                  60
Tyr Asp Pro Thr His Ala Trp Ser Gly Gly Leu Asp His Gln Leu Lys
65                  70                  75                  80
Met His Asp Leu Asn Thr Asp Gln Glu Asn Leu Val Gly Thr His Asp
                85                  90                  95
Ala Pro Ile Arg Cys Val Glu Tyr Cys Pro Glu Val Asn Val Met Val
            100                 105                 110
Thr Gly Ser Trp Asp Gln Thr Val Lys Leu Trp Asp Pro Arg Thr Pro
        115                 120                 125
Cys Asn Ala Gly Thr Phe Ser Gln Pro Glu Lys Val Tyr Thr Leu Ser
    130                 135                 140
Val Ser Gly Asp Arg Leu Ile Val Gly Thr Ala Gly Arg Arg Val Leu
145                 150                 155                 160
Val Trp Asp Leu Trp Asn Met Gly Tyr Val Gln Gln Arg Arg Glu Ser
                165                 170                 175
Ser Leu Lys Tyr Gln Thr Arg Cys Ile Arg Ala Phe Pro Asn Lys Gln
            180                 185                 190
Gly Tyr Val Leu Ser Ser Ile Glu Gly Arg Val Ala Val Glu Tyr Leu
        195                 200                 205
Asp Pro Ser Pro Glu Val Gln Lys Lys Lys Tyr Ala Phe Lys Cys His
    210                 215                 220
Arg Leu Lys Glu Asn Asn Ile Glu Gln Ile Tyr Pro Val Asn Ala Ile
225                 230                 235                 240
Ser Phe His Asn Ile His Asn Thr Phe Ala Thr Gly Gly Ser Asp Gly
                245                 250                 255
Phe Val Asn Ile Trp Asp Pro Phe Asn Lys Lys Arg Leu Cys Gln Phe
            260                 265                 270
His Arg Tyr Pro Thr Ser Ile Ala Ser Leu Ala Phe Ser Asn Asp Gly
        275                 280                 285
Thr Thr Leu Ala Ile Ala Ser Ser Tyr Met Tyr Glu Met Asp Asp Thr
    290                 295                 300
Glu His Pro Glu Asp Gly Ile Phe Ile Arg Gln Val Thr Asp Ala Glu
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305 310 315 320
Thr Lys Pro Lys Ser Thr
325

<210> 30
<211> 368
<212> PRT
<213> Homo sapien

<400> 30
Met Ser Leu Phe Gly Thr Thr Ser Gly Phe Gly Thr Ser Gly Thr Ser
1 5 10 15
Met Phe Gly Ser Ala Thr Thr Asp Asn His Asn Pro Met Lys Asp Ile
20 25 30
Glu Val Thr Ser Ser Pro Asp Asp Ser Ile Gly Cys Leu Ser Phe Ser
35 40 45
Pro Pro Thr Leu Pro Gly Asn Phe Leu Ile Ala Gly Ser Trp Ala Asn
50 55 60
Asp Val Arg Cys Trp Glu Val Gln Asp Ser Gly Gln Thr Ile Pro Lys
65 70 75 80
Ala Gln Gln Met His Thr Gly Pro Val Leu Asp Val Cys Trp Ser Asp
85 90 95
Asp Gly Ser Lys Val Phe Thr Ala Ser Cys Asp Lys Thr Ala Lys Met
100 105 110
Trp Asp Leu Ser Ser Asn Gln Ala Ile Gln Ile Ala Gln His Asp Ala
115 120 125
Pro Val Lys Thr Ile His Trp Ile Lys Ala Pro Asn Tyr Ser Cys Val
130 135 140
Met Thr Gly Ser Trp Asp Lys Thr Leu Lys Phe Trp Asp Thr Arg Ser
145 150 155 160
Ser Asn Pro Met Met Val Leu Gln Leu Pro Glu Arg Cys Tyr Cys Ala
165 170 175
Asp Val Ile Tyr Pro Met Ala Val Val Ala Thr Ala Glu Arg Gly Leu
180 185 190
Ile Val Tyr Gln Leu Glu Asn Gln Pro Ser Glu Phe Arg Arg Ile Glu
195 200 205
Ser Pro Leu Lys His Gln His Arg Cys Val Ala Ile Phe Lys Asp Lys
210 215 220
Gln Asn Lys Pro Thr Gly Phe Ala Leu Gly Ser Ile Glu Gly Arg Val
225 230 235 240
Ala Ile His Tyr Ile Asn Pro Pro Asn Pro Ala Lys Asp Asn Phe Thr
245 250 255
Phe Lys Cys His Arg Ser Asn Gly Thr Asn Thr Ser Ala Pro Gln Asp
260 265 270
Ile Tyr Ala Val Asn Gly Ile Ala Phe His Pro Val His Gly Thr Leu
275 280 285
Ala Thr Val Gly Ser Asp Gly Arg Phe Ser Phe Trp Asp Lys Asp Ala
290 295 300
Arg Thr Lys Leu Lys Thr Ser Glu Gln Leu Asp Gln Pro Ile Ser Ala
305 310 315 320
Cys Cys Phe Asn His Asn Gly Asn Ile Phe Ala Tyr Ala Ser Ser Tyr
325 330 335
Asp Trp Ser Lys Gly His Glu Phe Tyr Asn Pro Gln Lys Lys Asn Tyr
340 345 350

Ile Phe Leu Arg Asn Ala Ala Glu Glu Leu Lys Pro Arg Asn Lys Lys
355 360 365

<210> 31
<211> 352
<212> PRT
<213> Schizosaccharomyces pombe

<400> 31
Met Ser Leu Phe Gly Gln Ala Thr Thr Ser Thr Val Ser Asn Ala Thr
1 5 10 15
Gly Asp Leu Lys Lys Asp Val Glu Val Ala Gln Pro Pro Glu Asp Ser
20 25 30
Ile Ser Asp Leu Ala Phe Ser Pro Gln Ala Glu Tyr Leu Ala Ala Ser
35 40 45
Ser Trp Asp Ser Lys Val Arg Ile Tyr Glu Val Gln Ala Thr Gly Gln
50 55 60
Ser Ile Gly Lys Ala Leu Tyr Glu His Gln Gly Pro Val Leu Ser Val
65 70 75 80
Asn Trp Ser Arg Asp Gly Thr Lys Val Ala Ser Gly Ser Val Asp Lys
85 90 95
Ser Ala Lys Val Phe Asp Ile Gln Thr Gly Gln Asn Gln Gln Val Ala
100 105 110
Ala His Asp Asp Ala Val Arg Cys Val Arg Phe Val Glu Ala Met Gly
115 120 125
Thr Ser Pro Ile Leu Ala Thr Gly Ser Trp Asp Lys Thr Leu Lys Tyr
130 135 140
Trp Asp Leu Arg Gln Ser Thr Pro Ile Ala Thr Val Ser Leu Pro Glu
145 150 155 160
Arg Val Tyr Ala Met Asp Cys Val His Pro Leu Leu Thr Val Ala Thr
165 170 175
Ala Glu Arg Asn Ile Cys Val Ile Asn Leu Ser Glu Pro Thr Lys Ile
180 185 190
Phe Lys Leu Ala Met Ser Pro Leu Lys Phe Gln Thr Arg Ser Leu Ala
195 200 205
Cys Phe Ile Lys Gly Asp Gly Tyr Ala Ile Gly Ser Val Glu Gly Arg
210 215 220
Cys Ala Ile Gln Asn Ile Asp Glu Lys Asn Ala Ser Gln Asn Phe Ser
225 230 235 240
Phe Arg Cys His Arg Asn Gln Ala Gly Asn Ser Ala Asp Val Tyr Ser
245 250 255
Val Asn Ser Ile Ala Phe His Pro Gln Tyr Gly Thr Phe Ser Thr Ala
260 265 270
Gly Ser Asp Gly Thr Phe Ser Phe Trp Asp Lys Asp Ser His Gln Arg
275 280 285
Leu Lys Ser Tyr Pro Asn Val Gly Gly Thr Ile Ser Cys Ser Thr Phe
290 295 300
Asn Arg Thr Gly Asp Ile Phe Ala Tyr Ala Ile Ser Tyr Asp Trp Ser
305 310 315 320
Lys Gly Tyr Thr Phe Asn Asn Ala Gln Leu Pro Asn Lys Ile Met Leu
325 330 335
His Pro Val Pro Gln Asp Glu Ile Lys Pro Arg Pro Lys Lys Gly Arg
340 345 350

<210> 32
<211> 365
<212> PRT
<213> Saccharomyces cerevisiae

<400> 32

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Met Ser Phe Phe Asn Arg Ser Asn Thr Thr Ser Ala Leu Gly Thr Ser
 1               5                  10                  15
Thr Ala Met Ala Asn Glu Lys Asp Leu Ala Asn Asp Ile Val Ile Asn
            20                  25                  30
Ser Pro Ala Glu Asp Ser Ile Ser Asp Ile Ala Phe Ser Pro Gln Gln
        35                  40                  45
Asp Phe Met Phe Ser Ala Ser Ser Trp Asp Gly Lys Val Arg Ile Trp
    50                  55                  60
Asp Val Gln Asn Gly Val Pro Gln Gly Arg Ala Gln His Glu Ser Ser
65                  70                  75                  80
Ser Pro Val Leu Cys Thr Arg Trp Ser Asn Asp Gly Thr Lys Val Ala
                85                  90                  95
Ser Gly Gly Cys Asp Asn Ala Leu Lys Leu Tyr Asp Ile Ala Ser Gly
            100                 105                 110
Gln Thr Gln Gln Ile Gly Met His Ser Ala Pro Ile Lys Val Leu Arg
        115                 120                 125
Phe Val Gln Cys Gly Pro Ser Asn Thr Glu Cys Ile Val Thr Gly Ser
    130                 135                 140
Trp Asp Lys Thr Ile Lys Tyr Trp Asp Met Arg Gln Pro Gln Pro Val
145                 150                 155                 160
Ser Thr Val Met Met Pro Glu Arg Val Tyr Ser Met Asp Asn Lys Gln
                165                 170                 175
Ser Leu Leu Val Val Ala Thr Ala Glu Arg His Ile Ala Ile Ile Asn
            180                 185                 190
Leu Ala Asn Pro Thr Thr Ile Phe Lys Ala Thr Thr Ser Pro Leu Lys
        195                 200                 205
Trp Gln Thr Arg Cys Val Ala Cys Tyr Asn Glu Ala Asp Gly Tyr Ala
    210                 215                 220
Ile Gly Ser Val Glu Gly Arg Cys Ser Ile Arg Tyr Ile Asp Asp Gly
225                 230                 235                 240
Met Gln Lys Lys Ser Gly Phe Ser Phe Lys Cys His Arg Gln Thr Asn
                245                 250                 255
Pro Asn Arg Ala Pro Gly Ser Asn Gly Gln Ser Leu Val Tyr Pro Val
            260                 265                 270
Asn Ser Ile Ala Phe His Pro Leu Tyr Gly Thr Phe Val Thr Ala Gly
        275                 280                 285
Gly Asp Gly Thr Phe Asn Phe Trp Asp Lys Asn Gln Arg His Arg Leu
    290                 295                 300
Lys Gly Tyr Pro Thr Leu Gln Ala Ser Ile Pro Val Cys Ser Phe Asn
305                 310                 315                 320
Arg Asn Gly Ser Val Phe Ala Tyr Ala Leu Ser Tyr Asp Trp His Gln
                325                 330                 335
Gly His Met Gly Asn Arg Pro Asp Tyr Pro Asn Val Ile Arg Leu His
            340                 345                 350
Ala Thr Thr Asp Glu Glu Val Lys Glu Lys Lys Lys Arg
        355                 360                 365
```